Forsyth R.

The challenge of triaging apparently mild paediatric traumatic brain injury in the Emergency Room: we're not there yet.

***European Journal of Paediatric Neurology* 2017**

DOI: https://doi.org/10.1016/j.ejpn.2017.08.009

The challenge of screening the large number of paediatric attendances at hospital Emergency Departments (EDs) with mild traumatic brain injury (TBI) for the very small number harbouring significant intracranial pathology (at risk of preventable secondary deterioration and neurological insult) is well recognised. Past policies of mass inpatient-admission for clinical observation for deterioration failed because of very poor specificity. The very large majority of these children remained well, breeding complacency amongst the junior medical and nursing staff charged with the skilled task of neurological observation(1). In most countries, such clinical assessment-based strategies have largely been replaced by CT-based triage, on the grounds that clinical features (e.g. headache, vomiting) are just too non-specific. Most children, even those who are symptomatic, do well. Admitting children only with known CT abnormalities focuses minds, and can be centralised in units with appropriate expertise.

In many countries, national clinical guidelines identifying children who should have CT scans have been drawn up. These generally prioritise sensitivity over specificity and for a long time there have been concerns about the unintended consequences of their implementation(2) particularly as the threshold for attendance at EDs appears to be falling(3). This increasing readiness to attend ED (at least in North America) may be due to increased public awareness of sports-related concussion, but it reduces the prior likelihood of a CT identifying significant pathology.

Lenstra et al's report in this issue(4) contributes usefully to the debate. It comprises an analysis of the management of children with mild TBI attending a single Dutch centre before and after the implementation of the UK-developed National Institute of Clinical Excellence (NICE) guidelines. The important findings of the paper are that guideline implementation has resulted in an increased use of CT scanning (with a small, but non-zero, risk of resulting brain malignancies) *and* an increase in hospital admission. This latter finding is unexpected. Many authorities thought that increased use of CT scanning would result in reduced admission (as only children with known abnormalities on CT would be admitted). This data would suggest a double-hit of undesirable consequences: in younger children the guidelines were often not implemented and children were admitted rather than imaged. Adolescents were imaged *and* admitted.

As with any longitudinal study, the reader needs to bear in mind the possibility of concurrent secular changes that might have affected case mix: e.g. any alterations in referral patterns.

In this series there was no evidence of benefit from the implementation of the policy in terms of increased detection of intracranial pathology. However as the authors acknowledge, with n=633, the study is inadequately powered to detect rare events (i.e. to assess whether guideline implementation has reduced the incidence of late deteriorations e.g. due to subdural haematoma).

1. Forsyth R. The CHALICE rule: ready for prime time? *Archives of Disease in Childhood*. [Online] 2006;91(11): 877–878. Available from: doi:10.1136/adc.2006.104513

2. Forsyth R, Pearce M. The price of failure: triage after apparently minor head injury. *Archives of disease in childhood*. [Online] BMJ Publishing Group Ltd and Royal College of Paediatrics and Child Health; 2013;98(12): 925–926. Available from: doi:10.1136/archdischild-2013-304436

3. Colvin JD, Thurm C, Pate BM, Newland JG, Hall M, Meehan WP. Diagnosis and acute management of patients with concussion at children's hospitals. *Archives of Disease in Childhood*. [Online] 2013;98(12): 934–938. Available from: doi:10.1136/archdischild-2012-303588

4 Leenstra *et al Influence of guidelines on management of paediatric mild Traumatic Brain Injury: CT-assessment and admission policy. EJPN THIS ISSUE*